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DISEASES of the JOINTS of the KNEE
and ELBOW.

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DISEASES of the JOINTS of the KNEE
and ELBOW,

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LETTER to MR. PERCIVAL POTT.

By H. PARK, of LIVERPOOLE,
ONE OF THE SURGEONS OF THE HOSPITAL.

L O N D O N :

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S I R,

SOME months ago I mentioned to you, that my attention had been lately somewhat engaged in attempting what I apprehended to be a new mode of treating some of the affections of the larger articulations.

From the regard which you always shewed me whilst I was under your roof, and from that steady friendship with which you have honoured me since, I am encouraged to hope you will not think I am committing

too great a trespass on your patience, in giving you a more detailed account of that business, with a view, provided I have your approbation, of submitting it to public inspection. I hope that the importance of the subject will in some measure apologize for me, as it must be allowed, that, of the various injuries and diseases by which mankind are deprived of limbs, those affecting the larger articulations form no inconsiderable share.

Scrophulous affections of the joints, commonly distinguished by the name of White Swellings;—collections of pus in the articular cavities, originating in simple inflammation;—gun-shot wounds and compound fractures of the joints;—nay, even the most simple, penetrating wounds, however favourable may be the termination in some few cases, are nevertheless, in spite of all the modes of obtaining relief hitherto discovered, but too frequently productive of
such

such a train of evils, as terminate at length in the destruction of the unhappy sufferer, unless prevented by the timely removal of the limb. To enumerate these evils, would be only to take up your time and attention with what is already too well known to every practitioner in surgery; and to attempt to adduce arguments or facts in support of the above assertion, would be only taking pains to prove what is already pretty generally acknowledged. To alleviate in some degree these evils, and to avert some of the dreadful consequences, is the design of these few sheets; in which I hope to shew, that in some of the affections of the knee and elbow, in which amputation has hitherto been deemed indispensibly necessary, Surgery has yet another resource, which, as far my reading and experience enable me to judge, has not yet been attempted by any other practitioner; and by which the limbs of persons under the above circumstances may yet be preserved, with such a share of the

motions which Nature had originally allotted to them, as to be considerably more useful than any invention which art has hitherto been able to substitute in their stead.

The resource I mean is the *total extirpation of the Articulation*, or the entire removal of the extremities of all the bones which form the joints, with the whole, or as much as possible, of the Capsular Ligament ; thereby obtaining a cure by means of Callus, or by uniting the Femur and Tibia, when practised on the knee ; and the Humerus, Radius, and Ulna, when at the elbow, into one bone, without any moveable articulation.

The practicability of such an operation, with a probability of success, occurred to me some years ago ; but as the undertaking appeared liable to many difficulties and objections, I wished to avoid being too precipitate in the attempt, and therefore frequently made it the subject of conversation with different

Gentlemen

Gentlemen of the profession. The principal difficulties that occurred, either from my own reflections, or the observations of my friends, were as follows, viz. the hazard of wounding the principal blood-vessels;—the great inflammation, and large suppurations usually consequent on the wounds of the articulations;—the uncertainty of obtaining a firm Callus;—the loss of the insertions of the Extensor Muscles;—the doubt respecting the utility of the limb, provided a cure could be obtained;—the uncertainty of removing the whole disease when Caries gave rise to the operation;—and, when undertaken on account of scrophulous affections of the joints, the hazard of a return of the same disease. These difficulties, though they might appear at first sight very weighty, would, I was in hopes, on more attentive consideration, be found to lose much of their force. The danger of wounding the principal vessels in the arm was very trifling, their situation being sufficiently remote from the bone to place

them out of all hazard. In the knee there was much more room for apprehension on this score, the Popliteal Vessels passing so immediately between the Condyles of the Femur; I was however of opinion, that they might be avoided without much difficulty; but this was easily determined by experiment on the dead subject; with this view, therefore, as well as to determine the mode of operating, the following trials were made in the Spring of 1781.

An incision was made, beginning about two inches above the upper end of the Patella, and continued about as far below its lower extremity; another, crossing this at right angles, immediately above the Patella, the leg being in an extended state, was made through the tendons of the Extensor Muscles down to the bone, and nearly half round the limb; the lower angles formed by these incisions, were raised so as to lay bare the capsular ligament; the Patella was then taken out;

the

the upper angles were raised, so as fairly to denude the head of the Femur, and to enable me to pass a small catlin across the posterior flat part of the bone immediately above the Condyles, taking care to keep one of the flat sides of the point of the instrument quite close to the bone all the way. The catlin being withdrawn, an elastic spatula was introduced in its place, to guard the soft parts, while the Femur was sawed through: which done, the head of the bone thus separated was carefully dissected out; the head of the Tibia was then with ease turned out and sawn off, and as much as possible of the capsular ligament dissected away, leaving only the posterior part covering the vessels, which, on examining, I had the satisfaction to find had not only escaped unhurt, but that it was not a very narrow escape; they had still a pretty good covering, and had been through the whole operation far enough out of the course of the knife. It must be confessed, that the appearance of the wound was somewhat formidable, exhi-

biting a very large cavern, with very thin Parietes ; and, in short, there seemed little wanting to complete the amputation ; yet, as the limb below would not be deprived of any part of its nourishment ; and every healthy incised surface, as well as of bone as of soft parts, has a natural tendency to granulate, I could not see any room to doubt that Nature would find sufficient resources to repair this breach.—The next attempt was on the joint of the elbow ;— a simple, longitudinal incision was made from about two inches above, to the same distance below the point of the Olecranon ; the integuments raised, and an attempt made to divide the lateral ligaments, and dislocate the joint : but this being found difficult, the Olecranon was sawn off, by which means the joint became so much exposed, as to be easily dislocated without any transverse incision ; the lower extremity of the Os Humeri turned out and sawn off, and afterwards the heads of the Radius and Ulna. This appeared a very
easy

easy operation, not considering that this was a joint without disease, and in an emaciated subject, consequently one in which there was a great laxity of integuments ; in the diseased joint, I apprehend, the case will be found far different, and that it will be necessary to make the crucial incision, and to divide the Humerus above the Tuberosities, in the manner I have already described in the extirpation of the lower extremity of the Femur.

The next difficulty was the great inflammation, pain, and extensive suppurations, usually consequent on wounds of large articulations ; these appear to be, in a great measure, owing to the exposure of the Capsular Ligament, a membrane which, on the application of the slightest stimulus, is readily brought into a state of inflammatory tension, and is then most exquisitely sensible, and of a large cartilaginous surface, extremely unfavourable for the production of granulation : but it must be considered, that
by

By the operation in question, this ligament and cartilage would be removed, and a fresh incised surface obtained: besides, it is now well known that, on some occasions, large articulations may be treated with considerable freedom, without producing such dreadful consequences; of this the removal of the head of the Os Humeri, as practised by Messrs. White, Bent and Orred, and the sawing off the protruded extremities of bones in compound dislocations, as recommended by Gooch and others, though operations differing considerably from the one I am treating of, are sufficient proofs. Why the symptoms consequent on these operations have been so mild, I will not take upon me to determine, yet think it not improbable it may be owing not only to the free openings made for the discharge of matter, but, in a great measure, to the state of relaxation in which the remaining portion of capsular ligament was placed, by the removal of part of the bone forming the articulation. Now,
that

that I have had occasion to mention compound dislocations, it may not be thought out of place to relate a case of this kind, which fell under the care of Mr. Wainman, of Shripton, in Craven, twenty-three years ago, who has the greater merit, as that mode of treating compound dislocations was, at that time, but little practised. This case, which, in justice to Mr. Wainman, as well as to mankind in general, ought to have been published long since, he describes as “ a
 “ recent luxation of the Cubitus, occasioned
 “ by a fall from a horse in full speed, which
 “ forced the Os Humeri through the com-
 “ mon integuments a considerable length
 “ into the ground, and the bone was quite
 “ denudated ; and adds, there was not a pos-
 “ sibility of reducing it, and I thought it
 “ most eligible to take off the limb, which
 “ the family objected to. I called in Dr.
 “ Taylor, who was of my opinion, but it
 “ would not be complied with. We then
 “ judged it best to saw off the Os Humeri,
 “ which

“ which I did about an inch above the Sinus
 “ that receives the Olecranon ; I then placed
 “ the arm in such a position as I thought
 “ would be most advantageous, prognosticating an Anchylosis would ensue, in which
 “ I was much mistaken ; the person is now
 “ living, and can perform all the motions of
 “ the joint, which is as flexible as if nothing
 “ had ever been amiss.” Mr. Wainman, in
 another letter to my good friend Dr. Binns
 of this town, to whom I am indebted for the
 communication of the above, as I am to
 Mr. Wainman for his permission to insert it
 here, describes the Luxation more particularly,
 mentioning that the Os Humeri was
 dislocated inwards, and that the heads of the
 Radius and Ulna were forced under the Biceps
 Muscle.

The next objection was the doubt of obtaining a firm Callus : for this doubt I was in hopes there could be no reasonable foundation, as we daily see that when two living

surfaces

surfaces of bare bone are opposed to each other, they have ever a tendency to unite; and as we see nature so often effect this in these very articulations, under all the disadvantages of a diseased state of parts, surely there could be little reason to doubt that she would do, at least, as much when all disease was removed, and two perfectly healthy surfaces of bone were attempted to be united.

With respect to the loss of the insertions of the Extensor Muscles, it was sufficient to reply, that the joint being extirpated, there was no longer any want of muscles to move it; and that the incised ends of these muscles, as there would not be any part of them taken away, must unavoidably attach themselves to some part of the Callus; which was all that would be necessary.

The question concerning the utility of the limb, provided a cure could be obtained, was; indeed, a very important one, and deserved
well

well to be considered. In the arm, however, the advantages arising from the preservation of a hand and fingers, with all their original motions, except those of pronation and supination, were so very evident, and so very considerable, independent of the motions of the elbow, or of any considerations respecting the length of the arm, as not to leave room for a moment's hesitation, and were certainly sufficient to induce persons, in every station in life, to run many risks to obtain a cure on the terms I was proposing. In the leg, I own, I was less sanguine in my expectations of advantages equal to the hazard, and for the following reasons : The parts forming the Parietales of the Cavity, after the bone was removed, would be almost wholly tendinous or membranous ; the opening would not be a depending one ; the confinement to bed would be necessarily long ; and the limb would probably lose much of its length : whereas in the elbow the bone is much smaller, in proportion to the

whole of the limb, and is surrounded by a good deal of muscular flesh; the opening would be wholly depending, the confinement to bed but little, and the shortening of the limb a matter of no great importance. However, as these tendons and membranes would be placed in a state of considerable relaxation; as depending openings might be obtained if necessary; and as the confinement to bed would, probably, be no more than we often see patients support very well in cases of fracture, I did not see so much to fear even from these causes; and with respect to the loss of substance of bone, I expected to regain some part of that by callus; as it is well known to every attentive practitioner, that there is, in many fractures, a period of time, between the going off of inflammatory tension and the formation of callus, in which the limb may, if necessary, on account of much loss of bone, be kept in a state of extension, without material inconvenience; besides, on conversing with some persons who

had

had stiff knees from different causes, with the limbs of their natural length, I found that they laboured under some inconvenience for want of some degree of shortening ; as they found themselves obliged either to describe a circle at every step, to avoid striking their foot against every pebble that came in their way, or to seek an advantage by always keeping the stiff limb on the side of the lower ground ; hence it appeared that some degree of shortening of the limb would be of advantage to the patient, (a circumstance, in general, too little attended to in the construction of artificial limbs) but what this degree would be, proportioned to what would take place in consequence of this operation, experience only could decide ; could it, however, be kept within moderate bounds, I could then have no idea that a foot and toes performed so insignificant a share of the action of walking, independent of the flexion of the knee, as to leave a limb of this sort of no more value than a wooden one ; and, indeed,

the persons alluded to above with stiff knees, did certainly walk with a degree of firmness, security, and satisfaction, far superior to what the wearer of the best artificial leg I have yet seen can boast of; at the same time, I was ready to confess, that an artificial leg was an infinitely better substitute for a natural one, than any invention which art has yet furnished could be in place of a hand and fingers, and, therefore, should be more nice in the choice of cases, in which I should recommend this operation in the knee than in the elbow, until farther experience should enable me to distinguish more accurately in what cases it would or would not be admissible.

With regard to the two last objections, they certainly operated with some, if not with an equal degree of force against amputation; as in those few cases in which external marks were wanting to enable us to judge with tolerable accuracy of the extent of Ca-

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ries,

ries, we were equally unable to know whether it might not extend beyond the part in which we should amputate; and in those habits, in which a scrophulous acrimony was so prevalent as to occasion a return of the disease, it was altogether uncertain whether the next attack would be on this limb, on any other, or on any of the internal parts.

Upon the whole, I could not see any just cause to apprehend, that a person who had undergone an operation of this kind, would be in a less favourable state than one with a compound fracture with equal loss of bone, but in which the principal blood-vessels had escaped unhurt; sufficient openings were made for the discharge of Pus, &c. and the ends of the bones were made smooth by the removal of every ragged point and splinter; circumstances, under which I am happy to have it in my power to say, that a very considerable majority of those who are admitted into our Infirmary terminate happily. I am
very

very sensible that this is by no means the case in the London Hospitals ; how far the air of an Hospital, in the midst of so very large and populous a City, and the previous mode of living of the major part of those who are admitted there under these injuries may sufficiently account for this difference, I must leave others to determine ; yet think myself authorized to say, that the bad success to which I have been an eye witness in the treatment of injuries of this kind, which appeared in their nature by no means formidable, though under the care of gentlemen of the first rank and abilities in the profession, has been such, as to justify the removal of many such fractures as a practitioner in a country situation would not find much difficulty in curing ; for which reason I should hesitate much to undertake such an operation as I am now recommending on the knee, under such disadvantageous circumstances.

Such were the considerations which made me resolve to put this operation in practice the first favourable opportunity, which I did not long wait for, as at the time when the experiments related above were made on the dead subject I had under my care in the Infirmary, Hector M'Caghen, a strong, robust, Scotch sailor, aged thirty-three, who was admitted for a diseased knee of ten years standing; the joint, though pretty considerably enlarged, was by no means so much so as is frequently met with in scrophulous affections; yet the integuments were so tense as to appear incapable of yielding to farther distension; the contraction of the Flexor Muscles was such as to draw back the leg, so as to form a right angle with the thigh, in which position it was immoveably fixed; apparently some degree of union of the bones had begun to take place, but this could not yet be determined with certainty, as every attempt to communicate to the joint the smallest degree of motion, gave him the most excruciating pain.

pain. Various means were used for his relief, and, amongst others, blisters in their fullest extent, without the smallest benefit; but that I may not seem to say any thing to the discredit of a remedy in many cases so valuable, let it be understood, that in this case their application came too late, as it was pretty evident that Suppuration and Caries had taken place before he was admitted into the Infirmary, though as yet there was not any opening obtained. This poor man's sufferings, which had been some time great, were daily increasing, and his health daily declining, in such a degree, that he begun to beg to have the limb taken off. This, however, I could not consent to do, without first proposing and explaining to him the extirpation of the joint, in order that he might have the chance of such a cure, if he chose to take it; although, for reasons already explained, I rather wished to make the first attempt of this kind on the elbow: besides, what made this case rather more unfavour-

able was, that it was of the scrophulous kind, and that the motions of the foot and toes were but imperfect; yet as these parts, as well as the muscles that move them, were evidently free from disease, I was in hopes this arose merely from the painful state of the knee; and as the disease was evidently confined to the articulation, and the man was free from scrophulous affection in every other part, I did not hesitate to propose this operation, to which he assented without much hesitation, and it was accordingly done on the 2d of July, 1781.

In the performance of it one circumstance occurred, which I think necessary to mention particularly, as it led me, and consequently might possibly lead others, into some difficulty; which is, that I wished to avoid making the transverse incision, thinking it would be in my power, by a simple longitudinal one, after the Patella was removed, to raise the integuments so as to divide the

lateral and cross ligaments, and readily dislocate the joint, so as to be able to turn out the heads of the bones alternately, and saw off just as much as I might find diseased; but in this I was greatly deceived, and found that I had not made sufficient allowance for the difference between a healthy and a diseased state of parts; in short, there appeared such confusion of parts on opening the articulation, the ligaments being, in some parts, extremely thickened and horny, in others in a sloughy, suppurated state, with the Cartilages almost wholly destroyed, and the heads of the bones much eroded by the offensive matter of which there was a good deal in the joint; besides, that some degree of bony union had already begun to take place between the head of the Tibia and the inner Condyle of the Femur, that, after spending some time in the attempt, and consequently making the operation much more painful and tedious, it was thought adviseable to relinquish this idea, and to make the trans-

verse incision, and divide the Femur above the Condyles, as has been already described, in giving an account of the mode of operating on the dead subject ; in which I have likewise sufficiently described the manner in which the head of the Femur, as well as that of the Tibia, were removed ; it is, therefore, unnecessary to repeat it here. The quantity of bone removed was somewhat, though not much, more than two inches of the Femur, and of the Tibia rather more than one inch, which were but just enough to enable me to bring the leg into a right line with the thigh, the previous contraction of the Flexor Muscles being such as to keep the two sawn ends of bone in close contact ; the only artery that was divided in the operation was one on the anterior part of the knee, which ceased to bleed before the operation was concluded, although the pulsation continued pretty strong in the ankle ; the ends of the bones however, particularly that of the Femur, bled pretty freely. It will readily be conceived, that
there

there remained a considerable redundance of integument ; to support this so that it might not fall inwards between the ends of the bones, and to keep the edges of the incisions in tolerable apposition, till they should acquire some degree of firmness, a few stitches were passed through the skin, as well along the course of the transverse incision as of that part of the longitudinal one that extended up the thigh ; the lightest superficial dressings only were applied, and the limb placed in a case of tin sufficiently long to receive the whole of it, from the ankle to the insertion of the Glutæus Muscle.

The man passed the day in a good deal of pain ; had frequent vomitings, and lost a good deal of blood, so that in the evening, about six o'clock, I found him very languid, with a low, weak pulse, of about 120 ; on loosening the bandages, which were full of blood, and become very tight and uneasy, I found that the hæmorrhage had nearly ceased,
and

and the man became much easier ; the cavity of the wound was filled with coagulated blood, with which the integuments were distended to a very considerable size ; this I did not choose to remove, but contented myself with again dressing superficially with wax and oil, laying over it compresses dipt in cold Aq. Saturn. which were ordered to be kept constantly wet ; and an anodyne draught was given him.

July 3d. Had passed a restless night, but without much pain, or any farther hæmorrhage ; continued to have frequent sicknesses, and the integuments still continued much distended, but the leg and thigh remained free from swelling ; ordered to take the Saline Draughts in the effervescing state ; for drink to have butter-milk and lemonade, and to repeat the anodyne in the evening.

4th. Had passed an easy night, and slept a good deal ; had still some sickness, but begun
to

to have a desire for a little solid food, which was allowed him ; the coagulated blood beginning to dissolve and come away, and the tension to abate ; ordered to continue the same medicines and applications, with the addition of compresses, dipt in brandy, laid under each side of the limb ; and to have the pillows and bandages sprinkled with Sp. Vin. Camph. to correct the fœtor.

5th. Had not passed so good a night, complaining much of pain in the back, from posture ; had not any pain of consequence in the limb ; pulse 120, but very little heat or thirst ; had no sickness, except when he took the saline medicines, which were ordered to be discontinued ; as he had not yet had a stool since the operation, ordered to take Ol. Ricini ad Alvi Solution, and then to begin with Infus. Cortic. Peruv. and to repeat the anodyne in the evening. Removed the stitches from the inner transverse incision, in hopes of giving a more free discharge, but
without

without immediate effect, as union seemed, in a great measure, to have taken place; filled the cavity of the wound lightly with dry lint.

6th. Had had two stools; no more sickness; pulse 112, had some pain the day before in consequence of the motion given to the limb in adjusting the bandages, and in going to stool, but had passed a good night, and the limb very cool and easy; the swelling a good deal subsided; the lower end of the inner transverse wound had opened a little, giving vent to some matter; the outer incision united, and the stitch removed; ordered to continue the bark and the anodyne.

7th. The stitches above knee seemed to be doing mischief, by confining the integuments too much, the lower one was therefore removed, which gave a good deal of liberty, the wound opening about an inch giving much ease; the fore in general looked very
foul

foul and floughy, and the discharge very large and foetid ; in other respects as well as on the 6th ; ordered to change the infusion of bark for the decoction.

9th. The higher stitch on the thigh had torn out, and the wound had opened more largely, but looked cleaner, and the discharge in general was more moderate ; some uneasiness had been occasioned by the matter being too much confined by the pledgets, it was therefore ordered that after the cavity was lightly filled with dry lint, a turnip poultice be laid over it ; this application I find in general less uneasy than the carrots, and remarkably speedy and powerful in correcting the foetor of putrid ulcers, and therefore particularly valuable in an hospital. I believe it would have been better had I removed all the stitches at the first or second dressing, as their only use was to support the lax integuments until they should acquire sufficient firmness to prevent them from falling in between

tween the ends of the bones, which end was sufficiently answered by the inflammatory thickening in twenty-four hours. I am likewise of opinion, that it would have been better had I at the time of the operation filled the cavity lightly with dry lint, to have restrained the effusion from the ends of bone, and afterwards to have postponed dressing the wound as long as possible.

10th. The fore much sweeter, and the discharge improved in quality, and diminished in quantity;—granulations beginning to arise from both ends of the bone;—pulse 108;—belly regular;—his bed becoming very uncomfortable, he was removed into a fresh one.

12th. Had been a good deal disturbed the two last nights with spasms in the thigh; his general health however did not seem hurt by them, and the whole inner surface of the wound appeared granulated, and the bones
nearly

nearly covered ;—was ordered to increase his anodyne to 40 drops, and allowed a pint of ale per day.

14th. Had passed two better nights; though the spasms were still troublesome; had gotten the limb into a bad position, in consequence of turning too much on the side, the posture in which he had been accustomed to sleep for several years, but at present a very unfavourable one, as by this means the end of the Femur was raised too high, and cast outwards; this was rectified, though not without some pain and trouble. It may be sufficient to mention here once for all, that this circumstance gave me a good deal of trouble at different times during his whole confinement.

15th. Had passed a good night, free from spasms, without opiate; ordered to discontinue the poultices, and in their stead to have cloths dipt in a mixture of equal
parts

parts of lime-water and brandy, and a somewhat tighter bandage.

17th. The discharge at each dressing not nearly half as much as on the 15th, though the wound, which had hitherto been dressed twice a day, was reduced to one dressing only.

21st. The discharge no more than sufficient to moisten the dressings; the cavity in a great measure filled up, and the wound contracted to less than half its original size: the inner end of the transverse incision united, and nearly healed; the integuments, which on the decline of the swelling had been a good deal puckered on each side of the knee, had now adapted themselves very much, though there was still an overplus:—changed his bed again.

26th. Complained that the bark disagreed with him, and that he had two or three days vomited

vomited it up in the afternoon, and with it the greatest part of the food he had taken ; on which account it was discontinued ; he had at that time a good deal of night-sweats.

28th. The sickness gone off, and the sweatings abated. There appeared a small quantity of matter formed under the Cicatrix, on the inside of the knee, and was making its way through a small opening, into which a bit of sponge was introduced.

31st. An opening, about an inch in length, was obtained in the old Cicatrix by means of the sponge, and gave vent to about three ounces of pus.

August 2d. The discharge from the last mentioned opening very trifling ; the general wound contracting very fast ; the granulations from the two ends of bone in a great measure united ; still sweated a good deal in

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the

the night; ordered to take Elixir Vitriol, Acid. Gutt. xx. terquaterve de die.

4th. A small pustule, not larger than a nut-kernel, which had been observed two or three days on the inside of the leg, a little above the calf, in the place where he had formerly had an issue, but appeared too trifling to deserve notice, burst this day on taking off the dressings; and I was not a little surprized to find that it led into the cavity of an abscess, from which issued four or five ounces of pus, the principal lodgment of which was in the ham, where the skin seemed very thin; and I was in hopes a completely depending opening would soon be obtained. Two or three small scales of bone, being exfoliations from the inner edge of the Femur, not larger than a six-pence, came away this day.

7th. The sweatings much abated, and the discharge from this last opening very trifling.

9th. Ob-

9th. Observed two other small sinusses, one on the inside of the knee, the other on the anterior part, too trifling to deserve much notice. He had had during the preceding night a good deal of pain down the shin; the union however seemed to be gaining strength, as, on moving the foot from side to side, I observed that the motion was communicated in some degree to the thigh.

14th. Still complained of pain down the shin, and on the outside of the leg; and on examining, I observed near the head of the Fibula a small lodgment of matter, which on pressure was discharged from the general wound; I therefore made a small opening in the most depending part, and passed a seton through.

18th. Thinking the seton had sufficiently done its office, I removed it; and finding a good deal of excoriation and pustular eruption on the thigh, changed the Aq. Cal-

cis for Aq. Saturn, with brandy, of each equal parts.

21st. The excoriation and irruption much diminished ; still some little lodgment on the outside of the leg, but no pain ; the union evidently gaining strength : had his bed, splints, &c. again changed, which he bore with much less pain than any of his former movings.

23d. Finding the opening I had made on the outside closing up, and the quantity of matter increasng, introduced a fresh thread.

Sept. 1st. Dilated a small sinus on the inside of the knee ; the anterior wound reduced to a very small compass ; the union become so strong, that whatever rotatory motion was given to the leg, was communicated to the thigh ; though the Callus was still flexible.

Sth. Began

8th. Began to get out of bed, and to remain up a few hours every day; little or no discharge from the orifice in the calf of the leg, nor any sensible lodgment in the ham; his general health very good; the union become so strong, that he could, by taking hold of the leg with one hand, raise the limb, and turn it as he pleased without pain, though the Callus was still flexible; removed the seton.

15th. No fresh collection where the seton had been, and the opening seemed to be healing up.

October 1st. The wound on the outside completely healed; the cavity of the abscess in the ham pretty well consolidated; the orifice in the calf of the leg healed, and the anterior wound reduced to a very trifling excoriation of a very small surface; a very small discharge still remaining from the in-

sion of the knee; the Callus not sensibly improved for the last three weeks.

20th. Had a slight feverish attack, accompanied with a slight erysipelatous inflammation on the knee, which shewed a disposition to break out afresh; as there was great reason to believe that this might be in a great measure owing to long confinement in an hospital, it was thought adviseable to remove him into the country; accommodations were therefore procured for him in a farm-house about three miles from town, to which he was removed on the 22d; the Cicatrix of the anterior wound nevertheless gave way, degenerating into a spreading ulcer, which in a few days extended to the size of a crown piece; he was put upon the use of the Cortex in substance, and had the fore dressed with Tinct. Myrrh. cum Mell. Rosarum.

Nov.

Nov. 4. His health again perfectly re-established, and the fore again become clean, and in a healthy state ; the Callus seeming to acquire firmness.

Dec. 1st. The fore reduced to a very small compass, and the Callus sensibly improving ; began to walk about on crutches.

15th. The Callus become sufficiently hard to enable him to raise the limb, with the assistance of a hand under the thigh, without taking hold of the leg at all, and without the union appearing to give way in the least ; though, upon forcible handling, it had still an obscure degree of flexibility.

31st. Strong enough to raise the limb without the assistance of his hand.

Jan. 15, 1782. The Callus no longer at all flexible.

30th. A small abscess opened on the inside of the knee, but almost too trifling to be worth mentioning.

Feb. 28th. All wounds perfectly healed, and his strength daily improving.

March 23d. I was alarmed by a messenger, informing me that the man had fallen and broken his leg. This I had the satisfaction to find was in some degree a false alarm; he had however fallen, owing to the breaking of one of his crutches, and bruised the outside of his knee very much. This accident was followed by a good deal of pain, pretty high inflammation, and a large abscess, which burst in about a fortnight; and, when the pain and foreness were gone off, so that he could bear to have the limb handled with some degree of force, I found that the Callus was again become somewhat flexible; nor did it recover its solidity before the middle of June, during the greatest part of which time the
 orifice,

orifice, by which this abscess discharged itself, continued to ouze, though in a very trifling quantity : after this dried up, all the fores remained perfectly well. . He now began to make every day more use of the limb ; but, as it must be expected that muscles, which had been so very long out of action, and a limb that had suffered so great a waste, must be very weak, it was not before the end of July that they acquired sufficient firmness to support the weight of his body ; he then complained that his foot and toes, though he had recovered the perfect motion of them, were yet so weak, that it was with difficulty that he could support his whole weight on them, and begged to have a high-heeled shoe ; he was therefore allowed one with a heel an inch and a half higher than the one he wore on the other foot ; with this he was able to walk with great ease and firmness, without even the assistance of a stick, or of any kind of splint to support the union : he continued nevertheless, when out of doors,

to

to make use of a crutch and stick, which however I expect he will soon lay aside; and, on his going to work, he was furnished with a case of thin cow's leather, made to lace from the ankle to the upper part of the thigh, strengthened by a piece of thin plate-iron up the outside, to guard him from injury. The limb was at this time nearly three inches shorter than the other; the knee very slightly bowed outwards, owing to the difficulty of keeping him in a good position, which I have already mentioned, though not in such a degree as to occasion any deformity, but what might very readily pass unnoticed by an inattentive observer. The redundant integuments form a small plait on each side of the knee; the muscles, as may naturally be expected, are yet smaller than in the other leg and thigh; and the foot, by an exact measure, taken by the shoemaker who made his high-heeled shoe, three quarters of an inch shorter than the other. It will appear, by this account, that but a very small
part

part of the length lost by removal of bone; was in this case regained by Callus; but let it be remembered, that I have already remarked, that the previous contraction of the flexor muscles was such, as to make it impossible it should be otherwise, although I made some attempts, during the cure, to increase the length, by placing the limb in a state of moderate extension*.

Whoever barely considers the length of time from the performance of the above operation, to the completion of the cure, will perhaps think the process more tedious and troublesome than the event can compensate. On this account, perhaps it may not be amiss to recapitulate the following circumstances, viz. that the operation was done on the 2d of July; that the first symptoms were by no means severe; that the discharge, which for some days was very considerable, as must be expected from so large a surface of wound, was much diminished by the 10th; and by

* Since the above was written he has laid aside his crutch, has gotten a strong useful limb, free from pain or swelling, and is gone to sea.

the 21st was no more than sufficient to moisten the dressings; and that by this time the cavity of the wound was in a great measure filled up, and the ends of the bones covered by granulations; that of the subsequent collections of matter, only two were of any importance; nor were these such as to occasion the smallest apprehension of danger, or material difficulty: it was pretty evident that they were occasioned by the portion of diseased capsular ligament, which was unavoidably left in the posterior part; and probably they might have been prevented by a depending opening, which might have been made at the time of the operation, and perhaps effectually maintained, by introducing a seton into either extremity of the transverse wound, and bringing it out at the ham, taking care to avoid the vessels.—That the confinement to bed was between nine and ten weeks; which, as well as the time which the Callus took in forming, was not longer than many compound fractures require,

quire, in which it is nevertheless pretty clear, that the event must be favourable. On the whole, from what I now see of this man's limb, I do not hesitate to declare, that it appears to me so much more valuable than any artificial one, that, was I in his situation, I should infinitely prefer the former, at the price which he has obtained it : nor shall I hesitate to repeat and recommend the same attempt to others under similar circumstances ; at the same time, I must leave every Surgeon at liberty to determine for himself what he would recommend to his patient ; and every unhappy sufferer to fix his own value on his own limbs, and on the time and pains which it may be likely to cost him, either to preserve or part with them.

Whatever objections however may be made to the operation I have been describing on the knee, I apprehend few will refuse to subscribe to the utility of a similar one in affections of the articulation of the elbow.—

Though

Though here, perhaps, it may be objected, that I am recommending an operation which I have not yet performed on the living subject. I grant it;—yet think myself authorized to do so by the success of the attempt on a joint, in which I hope I have sufficiently shewn that the undertaking is attended with much greater difficulties and hazard; and by the event of the following case, which fell under the care of my worthy friend and colleague Mr. Alanfon, already sufficiently known to the surgical world, by his excellent Observations on Amputation; and which will be allowed to be much to my present purpose, as it was a case in which the same end was in some measure obtained, though by Nature alone, without the aid of instruments.

Elizabeth Malcomb, a woman upwards of fifty years of age, was admitted into the Infirmary on the 15th of March, 1781, for an extensive Gangrene in the Arm, occasioned
by

by a fall on the point of her elbow ; the Gangrene destroyed the greatest part of the Extensor Muscles, and integuments on the back part of the arm, laying the Os Humeri bare nearly as high as the shoulder, and laid the joint of the elbow largely open ; yet, as the Capsular Ligament was wholly destroyed, the subsequent symptoms were by no means urgent ; in a few weeks the Olecranon exfoliated, as did likewise the inner tuberosity of the Humerus with a scale about six inches long, one in breadth, and about as thick as a shilling, from the back part of that bone : the joint was soon filled by granulations, and healed over ; a firm Callus obtained, and the woman was discharged with a stiff elbow on the 19th of July following, having only a very small superficial sore unhealed in the upper part of the arm, for which she did not think proper to remain longer in the hospital, as her health was rather in a declining state. It can hardly be necessary to point out that this patient's fore-arm was

kept in a state of flexion ; nor that this is the position I should recommend after the extirpation of the elbow, as this is a practice which has long been sufficiently established in the treatment of every injury and disease of that joint, in which the recovery of perfect motion is at all doubtful ; but whether this should in all cases be such as to make the fore-arm form a right angle with the Humerus, or whether sometimes a more or less acute one ; and whether the position of the hand should in every case be an exact middle state, between the extremes of Pronation and Supination, are points which can only be determined with accuracy by considering the occupation in life of each individual patient. This Elizabeth Malcomb, as will be seen by the dates, was in the infirmary at the same time with Hector M'Caghen ; and her cure was drawing toward a conclusion when his knee was taken out, and gave me no small additional encouragement to undertake that operation.

After

After all, I beg I may not be so far misunderstood, as to have it supposed that I am sanguine enough to imagine, that the method I have been recommending will certainly succeed in every case ; I know the contrary, and fear that, after the Chirurgic Art has done all that it is capable of, many of these diseases will still occur, in which Amputation only can preserve the life of the patient. Of these I have met with three cases within the few last months ; two were knee cases, in which the disease of the soft parts was too extensive to encourage the attempt ; and the third an elbow case, in which not only the extent of caries was too great and uncertain, but the muscles moving the hand and fingers were so cemented together, as to have left these parts altogether useless, could they have been preserved. I have nevertheless reason to believe, that, even in these cases, extirpation might have succeeded at a more early period of the disease ; but the misfortune is, that persons labouring under diseased joints, are but sel-

dom willing to submit to any great operation, until their lives are brought into imminent danger ; in which state, amputation will be found the only resource. To define, however, with accuracy the cases in which extirpation will or will not be adviseable, can only be done by much experience. That it will be more likely to succeed in external injuries, than in diseases originating in scrophula, is too obvious to dwell upon ; should it, however, be found, on repeated experiments, to be ineligible in general in the knee, and even confined to those affections of the elbow that arise from external violence, I hope it will still be allowed to be an improvement in the Chirurgic Art, of sufficient value to justify me in calling the attention of the Public to the few foregoing pages.

I am, Sir, with due Respect,

Your most obliged and

obedient Servant,

Liverpool, Sept. 18, 1782.

H. P A R K.

P. S. I am conscious that the mode of operating which I have described is by no means perfect, but still stands in need of the finishing hand of a more able master.—

Query. May not the end be in some few cases obtained, by means of a single incision made transversely, half round the joint, so as to divide the lateral ligaments?—These points, however, will be sooner determined by those who have more frequent opportunities of making experiments both on the living and the dead.

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